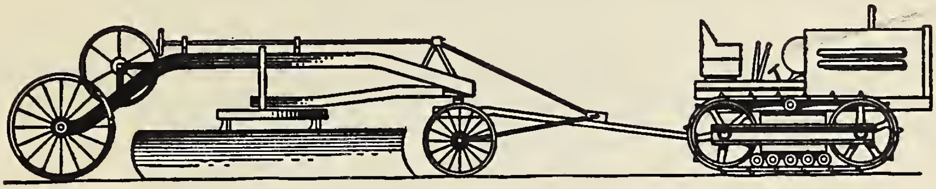
CONSTRUCTION



HINTS

UNITED STATES DEPARTMENT OF AGRICULTURE, FOREST SERVICE
WASHINGTON, D.C.

Volume 7 | January 1941 | Number 1

Volume 3, Number 3 of Construction Hints listed several mechanical items developed in the Region 6 shop. Among these was a truck cover for a stake truck of bow design. It recently came to the attention of this office that this design had escaped the notice of some. Accordingly at the request of this office Region 6 has furnished a description and illustrations of this item. These appear in this issue.

Also appearing in this issue is a description of a pneumatic concrete vibrator and shipping box developed in Region 6.

Mr. Donald M. Hamilton, Division of Engineering, Washington Office contributed the illustrated description of a machine designed for making field tests of concrete.

E. S. MASSIE, JR., EDITOR

DESCRIPTION OF SPECIAL STAKE TRUCK COVER DESIGN

This design was developed several years ago to improve on some of the short comings of the old wooden bow design. The more important features are as follows:

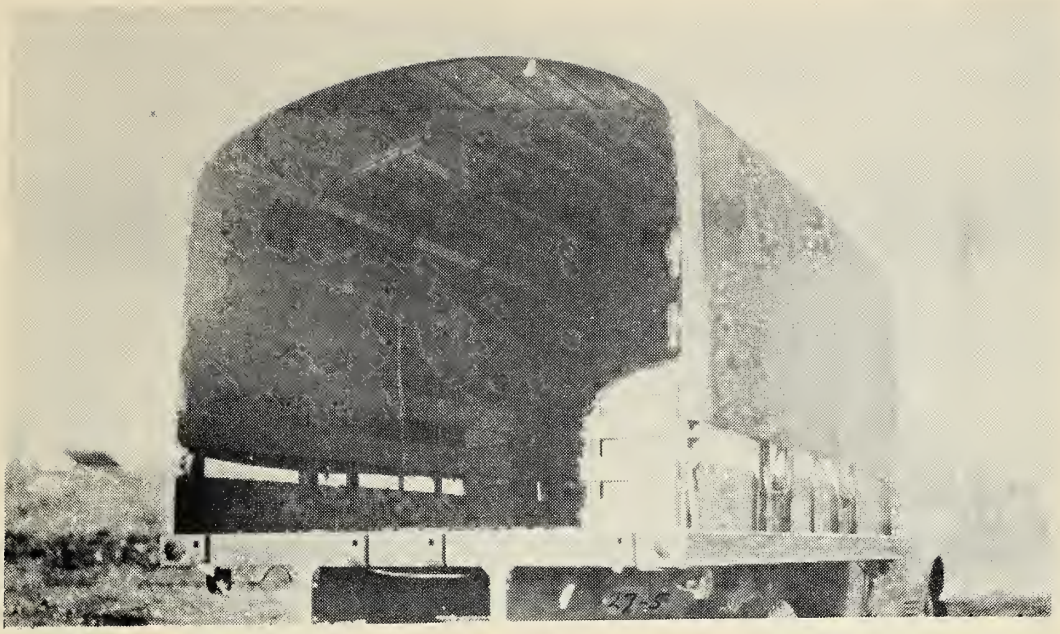
1. By the use of light longitudinal slats lengthwise, all sag in the canvas between bows is completely eliminated, canvas is stretched tight and neat and the life of the cover has been increased nearly three times.

2. Light channel bows with lengthwise strips provide a much sturdier frame or structure.

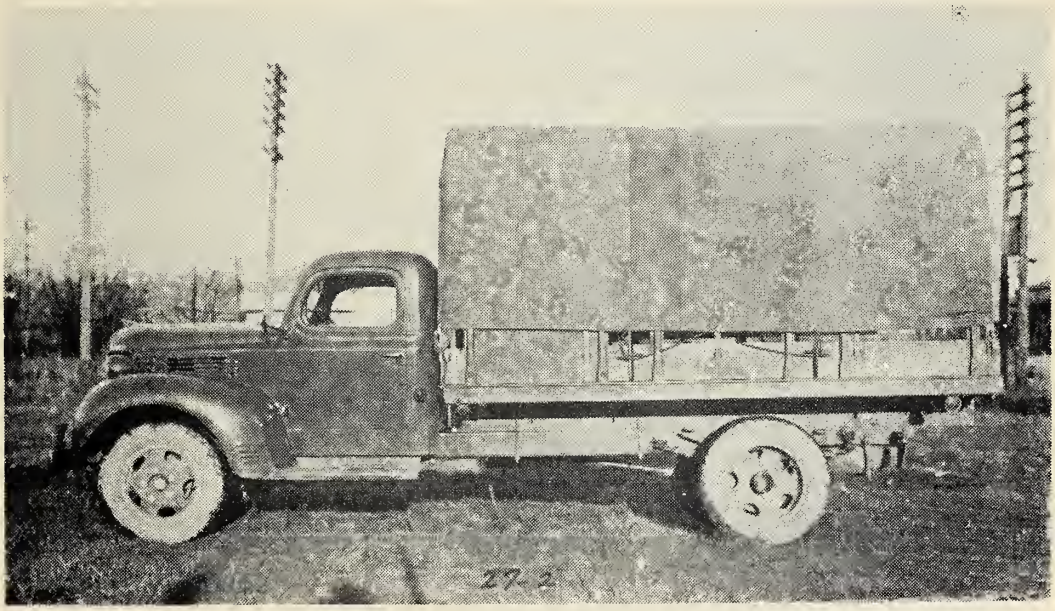
3. The steel channel bows can be bent on a shorter radius at the edges than wood, providing more clear space and better headroom at these points.

4. The complete frame structure does not deteriorate or get out of shape, and therefore is more economical over a long period of use.

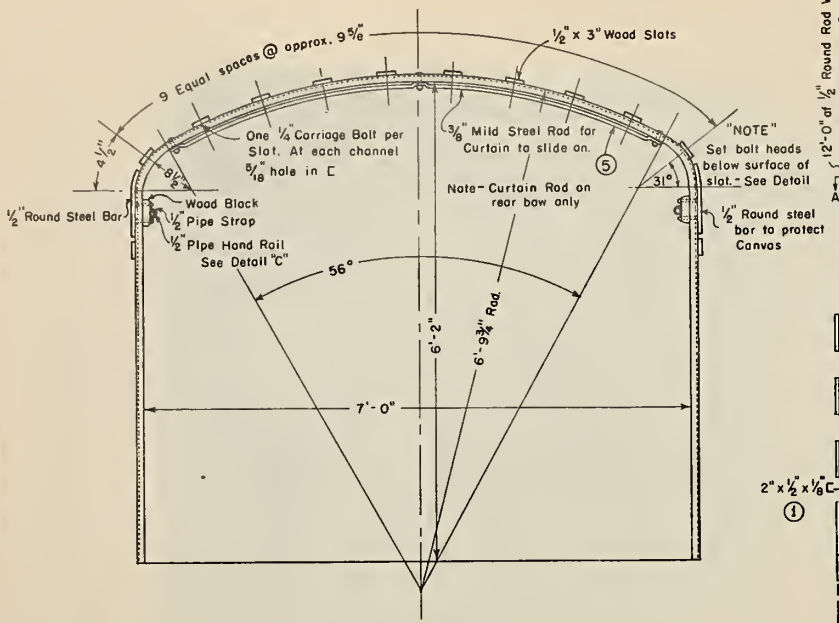
5. The cost of a set of steel bows, shaped and ready for use, is about the same as oak or other wooden bows. The longitudinal slats and their fastenings are the only additional cost over a plain, wooden bow design.

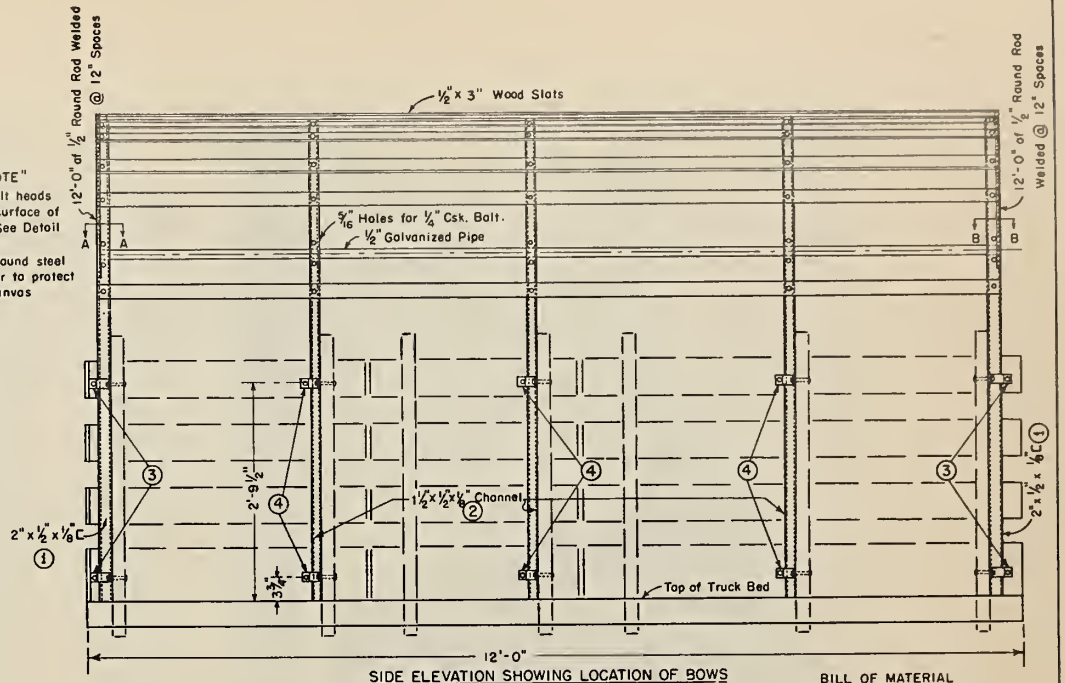


Stake truck cover design using light steel channel bows and light longitudinal wood strips.



Note good condition of canvas and no sag between bows.

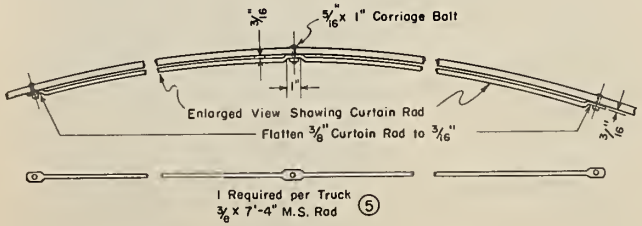


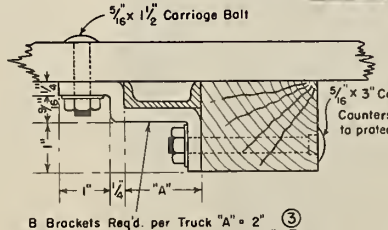


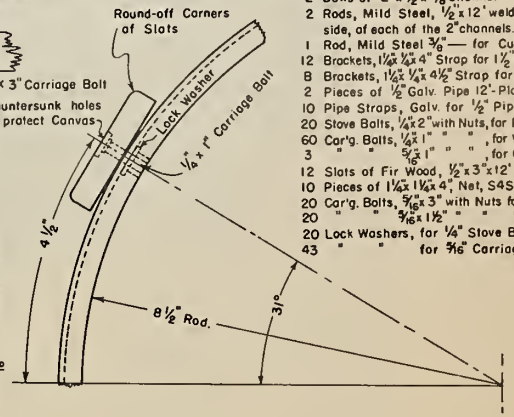
SIDE ELEVATION SHOWING LOCATION OF BOWS IN REFERENCE TO TRUCK STAKES

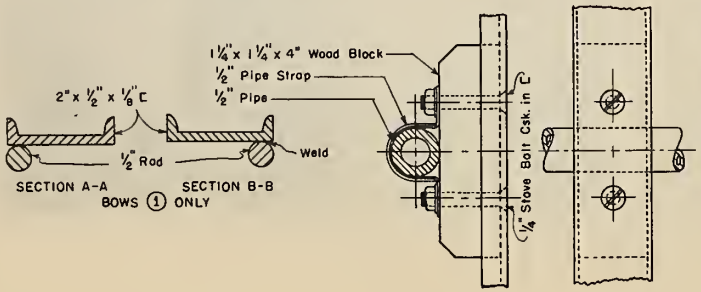
BILL OF MATERIAL

3	Bows of 1 1/2" x 1/2" x 1/8" Channel
2	Bows of 2" x 1/2" x 1/8" Channel
2	Rods, Mild Steel, 1/2" x 12' welded to outside, of each of the 2" channels. See Detail.
1	Rod, Mild Steel 3/8" — for Curtain
12	Brackets, 1 1/2" x 1/4" x 4" Strap for 1 1/2" Bows
8	Brackets, 1 1/2" x 1/4" x 4 1/2" Strap for 2" Bows
2	Pieces of 1/2" Galv. Pipe 12'- Plain ends
10	Pipe Straps, Galv. for 1/2" Pipe
20	Stove Bolts, 1/4" x 2" with Nuts, for Pipe Straps
60	Car'g. Bolts, 1/4" x 1" " " " for Wood Slats
3	" " 5/16" x 1" " " " for Curtain Rod
12	Slats of Fir Wood, 1/2" x 3" x 12' S4S
10	Pieces of 1 1/4" x 1 1/4" x 4", Net, S4S "Fir"
20	Car'g. Bolts, 5/16" x 3" with Nuts for Brackets
20	" " 5/16" x 1 1/2" " " " "
20	Lock Washers, for 1/4" Stove Bolts
43	" " for 5/16" Carriage Bolts









Detail "C"

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE - R-6

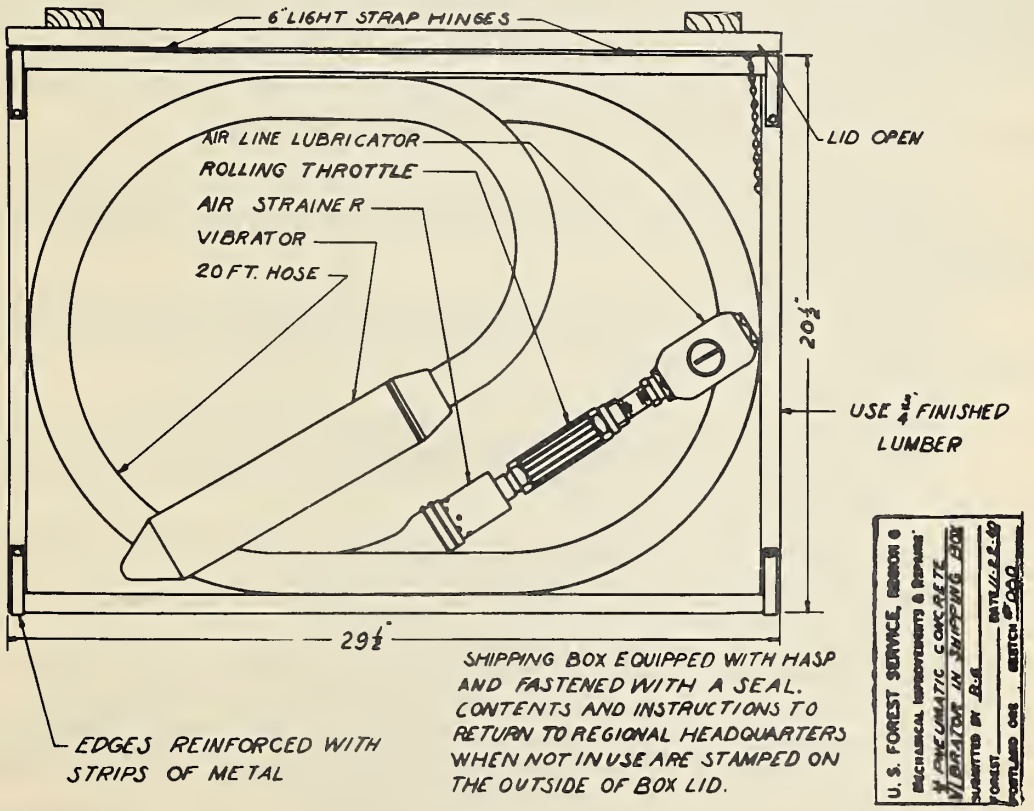
STAKE TRUCK COVER DESIGN

(USING LIGHT STEEL CHANNEL BOWS & LIGHT LONGITUDINAL WOOD STRIPS)

DESCRIPTION OF PNEUMATIC CONCRETE VIBRATOR and SHIPPING BOX

Two pneumatic concrete vibrators were purchased in this Region a few years ago and require frequent transfers from one point to another. Mr. H. E. Howes of the Division of Engineering conceived the idea of providing a standard shipping box container in order to insure against loss of individual parts and to encourage better care and maintenance of the vibrator unit with its hose.

Instructions to the user are stamped plainly on the cover of the box informing him that the vibrator unit is to be cleaned, packed in the box, sealed and returned to regional headquarters when not required for further use on the forest.



FIELD TESTING OF CONCRETE

D. M. Hamilton

The latest issue of the TRUCK TRAIL HANDBOOK, the WATER DEVELOPMENT AND SANITATION HANDBOOK, and others, together with Mr. Betts' article in the October, 1940 issue of CONSTRUCTION HINTS, all give excellent data on the making and placing of concrete.

Testing, however, has been confined principally to the making and storage of compression specimens. While compression testing is more generally accepted than flexure testing, it does have certain disadvantages on isolated jobs such as those encountered in the Forest Service.

These may be listed briefly as follows:

(1) Relatively expensive equipment and skilled laboratory personnel are required for testing, hence the services of an established laboratory must be obtained.

(2) Specimens are usually made in nonrigid molds which do not protect them from damage. If rigid molds are used, they are removed before shipping the specimens to laboratory, so that the samples are again subject to injury.

(3) The cost of shipping is high with the result that fewer specimens are made than are necessary for adequate control and reliable test results.

(4) Since only one test can be made on a specimen, there is no way to check discrepancies between 7- and 28-day tests.

(5) The test results are received on the job so long after the concrete they represent has been poured that they are of little more than academic interest.

Flexure testing is now recognized by the ASTM and has been adopted as a standard under designation C-78-39. Its advantages are as follows:

(a) The testing equipment is simple and inexpensive.
(b) Machines of the type shown give direct readings and require no computation. Hence the tests can be made on the job by unskilled personnel.
(c) The specimens are made in permanent molds which protect them until they are ready for testing.
(d) Since no shipping cost or testing fee is incurred, as many specimens as are needed can be made.
(e) Beams can be made long enough to provide for two tests, hence a 7- and a 28-day test can be made on each one.
(f) In cases of controversy or doubt the beam ends remaining after the flexure test can be forwarded to the laboratory for capping and compression testing.
(g) If early strength data is needed, tests can be made whenever necessary.

(h) The test results are immediately available on the job.
(i) Last but not least, the results obtained are more indicative of the true nature of the concrete, and the performance to be expected of it.

The curve shown in figure 1 is a summary of results obtained from hundreds of tests on one large project. The beams were tested in flexure in the field and the corresponding beam ends were then sent to the laboratory for compression testing.

The compressive strengths obtained from this curve will of course be those of modified cubes and are subject to correction to correspond to the values that would be obtained from standard compression specimens. However, since the variation is probably not more than 10 per cent, the values shown are sufficiently accurate for practical application.

Figure 2 is an illustration of a typical beam mold that can be used to cure specimens in contact with the concrete in the structure as illustrated in Fig. 4, or separately as desired.

Portable beam testing machines are made by several manufacturers of testing equipment and are similar in most respects, except that the application of load may be accomplished either mechanically or hydraulically.

The machine shown in figure 3 is a small portable beam testing machine weighting about 175 pounds. It employs the third point loading method of test approved by the ASTM and has a capacity of 1250 p.s.i. modulus of rupture with the standard 6" x 6" beam. Its cost is approximately $425.00.

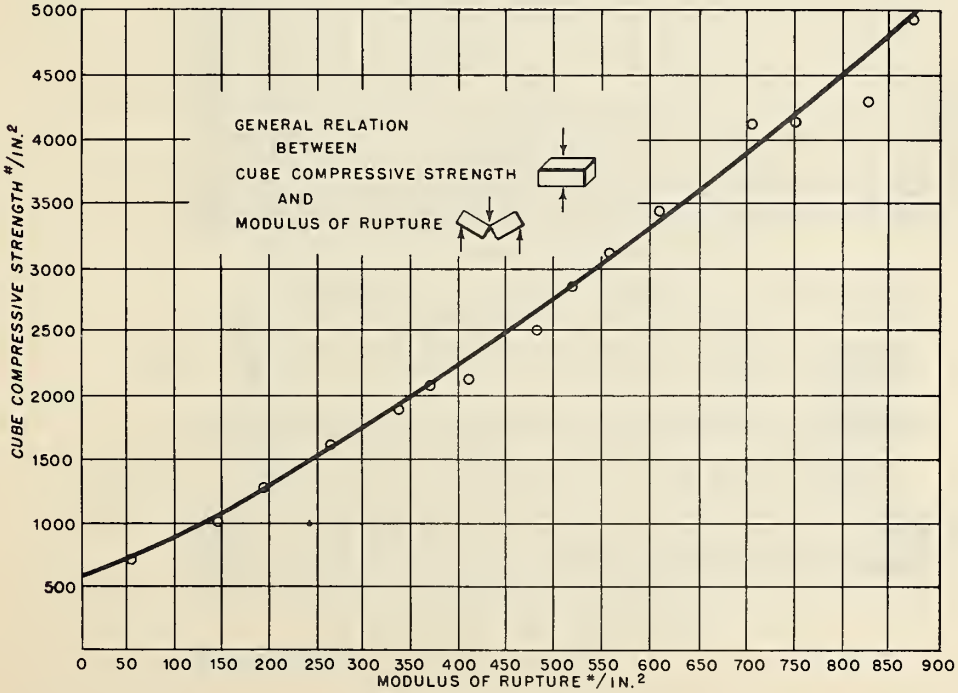


FIG. 1

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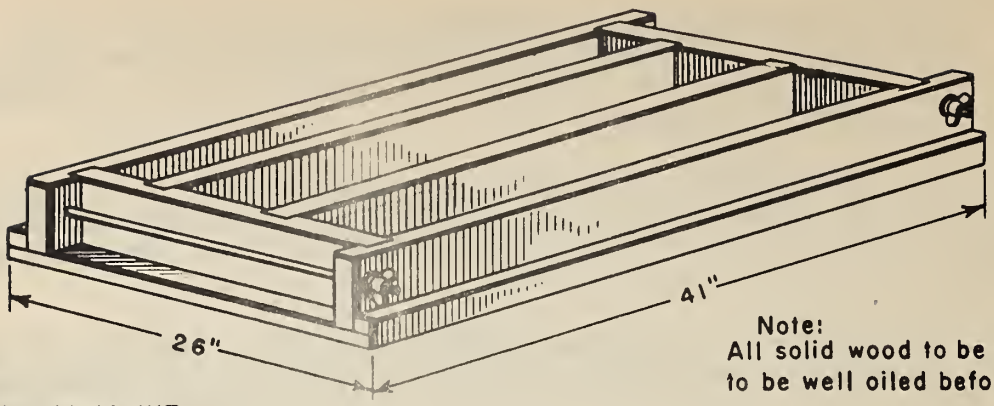
CONCRETE BEAM FORMS



Note:
All solid wood to be S4S and to be well oiled before use

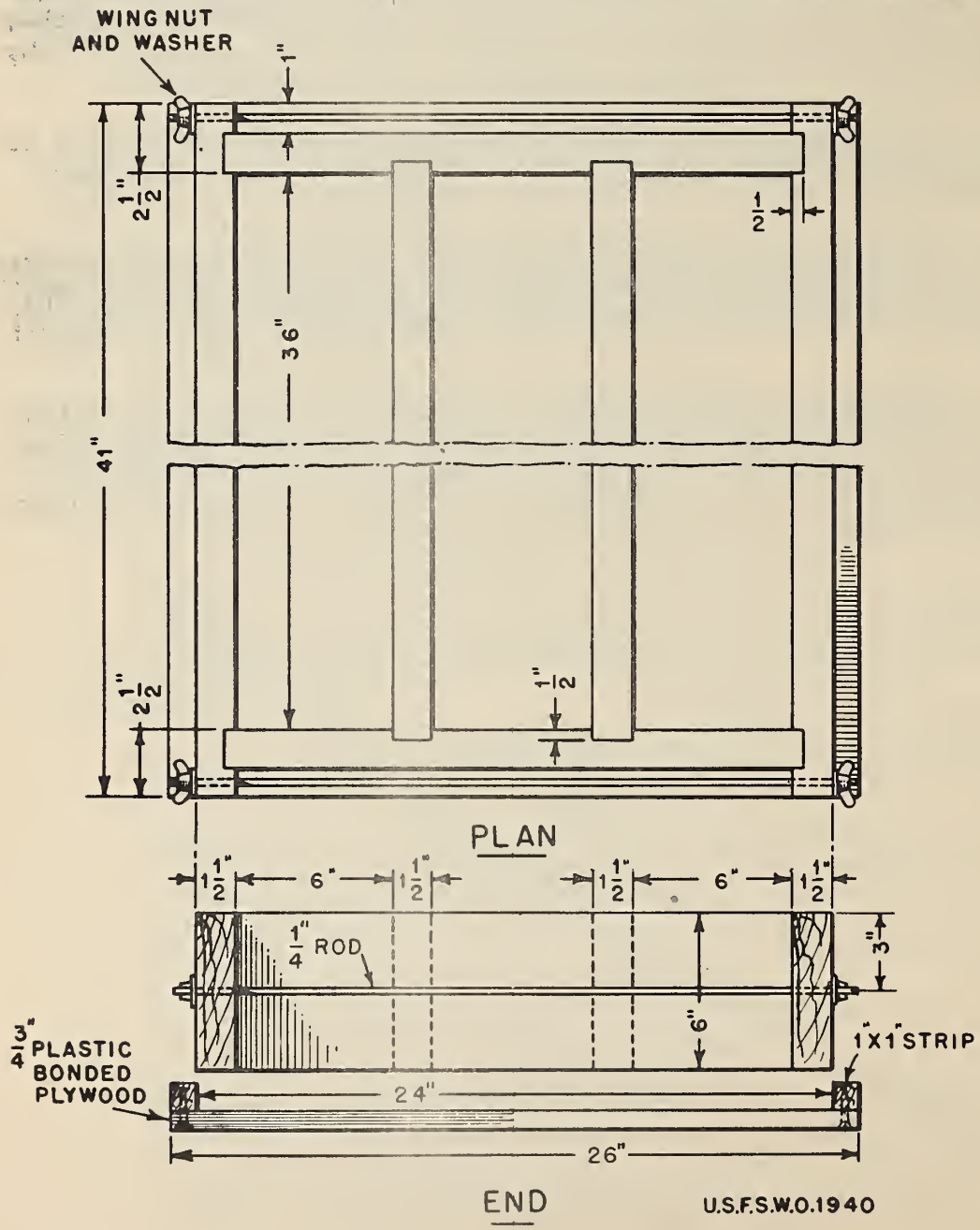
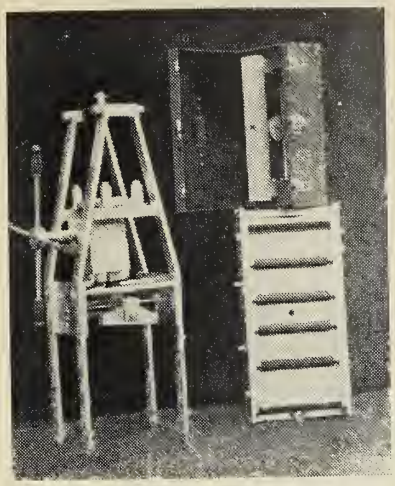
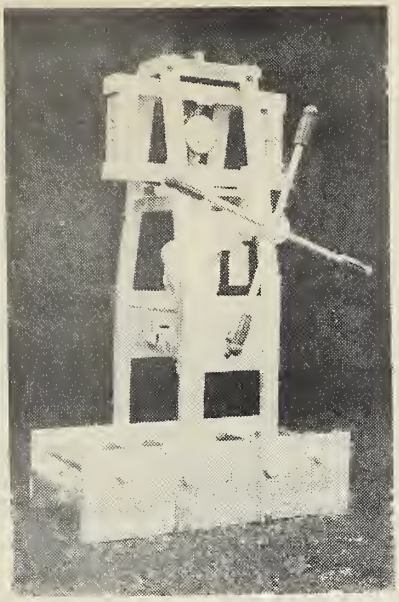


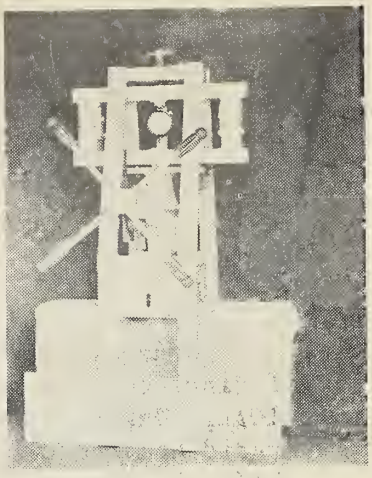
FIG. 2



Beam tester disassembled for easy handling.

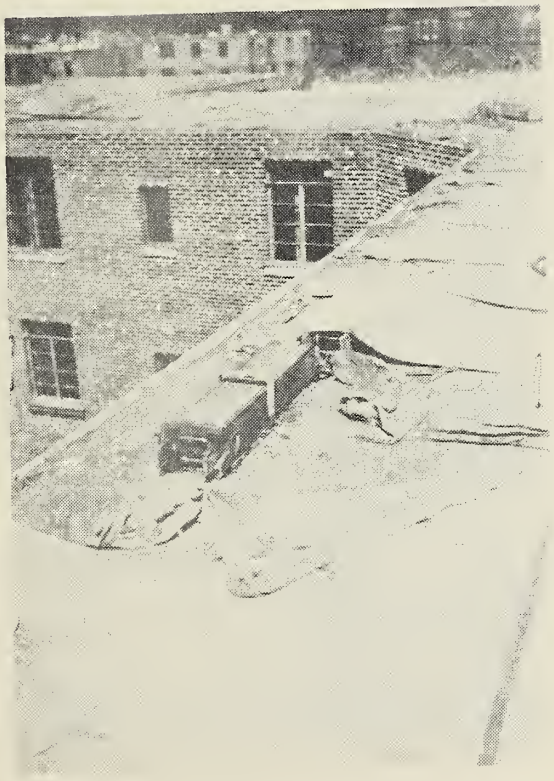


Machine Assembled and ready for use.



Machine with portion of beam inserted in position for testing.

Fig. 3



Beam test specimens being cured in contact with roof slab.

Fig. 4

Region 5 reports that they have been using bimetallic clutch facings on both main and steering clutches on crawler tractors since 1934. These clutch facings definitely give longer life and more rapid heat radiation than the conventional asbestos facing does. Definite figures are not available as to just what the increased service has been due to the fact that equipment is used seasonally on many different types of work. However, R-5 is fully convinced that bimetallic facing lasts at least twice as long as the conventional type. While metallic facing is somewhat more expensive than that usually furnished by the manufacturer, there is additional saving due to the fact that the labor cost of installing replacements is made necessary at fewer intervals. The material is available on the General Supply Schedule Contract No. 35540.